REMARKS

In response to the Office Action dated January 15, 2003, claim 10 has been cancelled and claims 1, 2, 4, 8, 9, 11, 13-15, 19 and 23 have been amended. Claims 1-4, 8, 9, 11-15 and 19-24 are now active in this application, of which claims 1 and 9 are independent. The Office Action indicates that claims 8, 14 and 19 are objected to but would be allowable if present in independent form.

Based on the above Amendments and the following Remarks, Applicant respectfully requests that the Examiner reconsider the outstanding objections and rejections and they be withdrawn.

Rejections Under 35 U.S.C. §103

In the Office Action, claims 1-4, 9-13, 15 and 20-24 have been rejected under 35 U.S.C. §103(a) for being unpatentable over U. S. Patent No.4,955,697 to Tsukada, *et al.* ("Tsukda) in view of U. S. Patent No. 5,646,756 issued to Dohjo, *et al.* ("Dohjo"). This rejection is respectfully traversed.

Regarding independent claim 1, the Examiner admitted that "Tsukada does not explicitly discloses ... an opening ratio of each pixel at the first pixel row is different from the opening ratio of the pixels at the other pixel rows". Regarding this missing features, the Examiner asserted "Dohjo teaches, in Figures 6 and 5, the use of a protecting film 23 (Applicant's black matrix), wherein an aperture ratio is lower in the peripheral portion of the display near the sealant and near the closing agent ... to prevent the development of deterioration of image

quality of peripheral portions ..." (Office Action, Pages 3-4). This assertion is respectfully disagreed with.

Amended claim 1 clearly recites "an opening ratio of the pixels on *a first row* is different from that of the pixels on the other rows". The present invention is directed to differentiating the opening ratio of *the pixels on the first row* of the pixels. This is because the brightness of the pixels on the first row is different from the brightness of the pixels on the other rows, as described in page 3 of the present application.

Tsukada fails to teach or suggest this claimed feature of differentiating the opening ratio of the pixels on the first row. Tsukada describes "[this] first gate insulating film 14, however, is vulnerable to the penetration of impurity ions and poor in moisture resistance so that impurity atoms ... maybe penetrated from this exposed portion A of the first gate insulating film 14 into the first gate insulating film 14. Similarly, water may encounter through the liquid crystal inlet port 40, which is closed with the closing agent 42, or through the sealant 39 and may penetrate into the first gate insulating film 14" (Column 2, Lines 39-48).

To solve these problems, in Tsukada, a protecting film is formed to overlap peripheral portions of the pixel electrodes that are located in the vulnerable portions of the display screen, for example, *near the liquid crystal inlet port*, as shown in Fig. 3. Tsukada specifically recites that "since the region within *a radius of at least 3 cm around the liquid crystal inlet port* is the most vulnerable to the deterioration of image quality, it is preferable to form the protecting film in such a manner as to overlap the peripheral portions of the display pixels which are located within a radius of at least 3 cm around the liquid crystal inlet port" (Column 5, Lines 28-34).

Also, as shown in Fig. 4, Tsukada describes forming a protecting film to overlap peripheral portions of *the pixel electrodes along the sealant and the closing agent* "since the

region of display image screen along the sealant and the closing agent are also vulnerable to the deterioration of image quality" (Column 5, Lines 36-42).

As described above, Tsukada is directed to forming a protecting film to overlap peripheral portions of the pixel electrodes along the sealant and the closing agent or located within a radius of at least 3 cm around the liquid crystal inlet port.

If a protecting film is formed to overlap the peripheral portions of the pixel electrodes located within a radius of at least 3 cm around the inlet port, the opening ratio of the pixels within that area (e.g., area W in Fig. 3) would have the same opening ratio regardless of their respective rows. This would fails to meet "an opening ratio of the pixels on *a first row* is different from that of the pixels on the other rows", as claimed.

Also, if a protecting film is formed to overlap the peripheral portions of the pixel electrodes along the sealant and the closing agent, the pixel electrodes formed on four side portions of the panel (e.g., area A in Fig. 4) would have the same opening ratio regardless of their respective rows. This would also fails to meet "an opening ratio of the pixels on *a first row* is different from that of the pixels on the other rows".

As dictated in MEPE 2143.03, "To establish *prima facie* obviousness of a claimed invention, all the claim limitation must be taught or suggested by the prior art". As present above, none of the applied references teaches or suggests "an opening ratio of the pixels on *a first row* is different from that of the pixels on the other rows", as recited in claim 1. Thus, it is submitted that claim 1 is patentable over the cited references. Claims 2-4 that are dependent from claim 1 would be also patentable at least for the same reason.

In this response, independent claim 9 has been amended to incorporate all the limitations of claim 10. Amended claim 9 recites "an opening ratio of each pixel on the first row is different from that of the pixels on the other rows".

As previously mentioned, none of the cited references teaches or suggests this claimed feature, and, hence, claim 9 would be patentable over Tsukada and Dohjo. Claims 11-13, 15 and 20-24 that are dependent from claim 9 would be also patentable at least for the same reason. Accordingly, Applicants respectfully request that the rejection over claims 1-4, 9, 11-13, 15 and 20-24 be withdrawn.

Other Matters

In the Office Action, claims 8, 14 and 19 have been objected to for being dependent from rejected base claims. Claims 8, 14 and 19 are dependent from independent claims 1 and 9. As previously mentioned, claims 1 and 9 are patentable over the cited references. Thus, withdrawal of the objection over claims 8, 14 and 19 is respectfully requested.

In this response, claims 1, 2, 4, 8, 9, 11, 13-15, 19 and 23 have been amended for better wording and correct informalities therein.

CONCLUSION

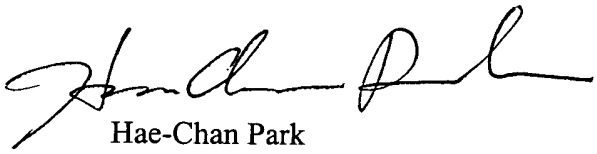
All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete response has been made to the outstanding Office Action and, as such, claims 1-4, 8, 9, 11-15 and 19-24 are in condition for allowance. If the

Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

It is not believed that any extensions of time or fees for net addition of claims are required at this moment. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. §1.136(a), and any fees required therefor (including fees for net addition of claims) are hereby authorized to be charged to our Deposit Account No. 23-1951. Please credit any overpayment to deposit Account No. 23-1951.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,



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APPENDIX A

Please amend claims 1, 2, 4, 8, 9, 11, 13-15, 19 and 23, as follows. The entire set of pending claims, including the "clean" version of the amended claims, is provided in the APPENDIX B.

1. (Amended) A liquid crystal display, comprising:

a first [insulating] substrate;

a plurality of gate lines formed [at] on the first substrate [to transmit] and transmitting scanning signals;

a plurality data lines crossing over the gate lines [to transmit] and transmitting picture signals;

a second [insulating] substrate facing the first substrate;

a liquid crystal layer [injected into the gap] formed between said first [insulating] substrate and said second [insulating] substrate;

a [pixel] plurality of pixels demarcated by the gate lines and the data lines, the gate lines demarcating the pixels into rows, and the data lines demarcating the pixels into columns;

a black matrix defining each pixel;

a pixel electrode formed [at] in each pixel; and

[a] storage [capacitor] capacitance formed between [said] each pixel electrode and [the previous gate line] the gate line of a previous row,[;]

wherein an opening ratio of [each pixel at the] the pixels on a first [pixel] row is different from [the opening ratio] that of the pixels [at] on the other [pixel] rows.

2. (Amended) The liquid crystal display of claim 1, wherein the opening ratio of the pixels on the first [pixel] row is [lower] smaller than [the opening ratio] that of the pixels on the other [pixel] rows.

4. (Amended) The liquid crystal display of claim 3, wherein the black matrix is formed on [at] the second substrate.

8. (Amended) The liquid crystal display of claim 2, wherein the opening ratio of the pixels on the first [pixel] row is [designed to be] 60% to [-]80% of [the opening ratio] that of the pixels on the other [pixel] rows.

9. (Amended) A liquid crystal display, comprising:

a first [insulating] substrate;

a plurality of gate lines formed [at] on the first substrate [to transmit] and transmitting scanning signals;

a plurality of data lines crossing over the gate lines [to transmit] and transmitting picture signals;

a second [insulating] substrate facing the first substrate;

a liquid crystal layer [injected into the gap] formed between said first [insulating] substrate and said second [insulating] substrate;

a [pixel] plurality of pixels demarcated by the gate lines and the data lines, the gate lines demarcating the pixels into rows, and the data lines demarcating the pixels into columns;

a black matrix defining each pixel;

a pixel electrode formed [at] in each pixel;

a storage capacitor line formed on said first [insulating] substrate parallel to the gate line, the storage capacitor line overlapping the pixel electrodes [at] on the first [pixel] row;

[a] first storage [capacitor] capacitance formed between [said] each pixel electrode and the [previous] gate line of a previous row; and,

[a] second storage [capacitor] capacitance formed between [said] each pixel electrode on the first row and said storage capacitor line[;],

wherein a gate-off voltage or a common electrode voltage is applied to said storage capacitor line, and

an opening ratio of each pixel on the first row is different from that of the pixels on the other rows.

10. (Cancelled)

11. (Amended) The liquid crystal display of claim [10] 9, wherein the opening ratio of the pixels on the first [pixel] row is [lower] smaller than [the opening ratio] that of the pixels [of] on the other [pixel] rows.

13. (Amended) The liquid crystal display of claim 12, wherein said black matrix is formed [at] on said second substrate.

14. (Amended) The liquid crystal display of claim 13, wherein an opening width of said black matrix [at] on the first [pixel] row [in the longitudinal direction of the gate line] is identical to [opening width] that of said black matrix [at] on the other [pixel] rows.

15. (Amended) The liquid crystal display of claim 13, wherein an opening length of said black matrix [at] on the first [pixel] row [in the longitudinal direction of the gate line] is [shorter] smaller than [opening length] that of said black matrix [at] on the other [pixel] rows.

19. (Amended) The liquid crystal display of claim 11, wherein the opening ratio of the pixels on the first [pixel] row is [designed to be] 60% [-] to 80% of [the opening ratio] that of the pixels on the other [pixel] rows.

23. (Amended) The liquid crystal display of claim 9, further comprising:

gate signal transmission films arranged [at] on said first substrate and provided with a gate driving integrated circuit [that is] electrically connected to the gate lines [and outputs] for applying gate driving signals thereto;[,] and

data signal transmission films arranged [at] on said first substrate and provided with a data driving integrated circuit [that is] electrically connected to the data lines [and outputs] for applying data driving signals thereto,

wherein a common electrode wire for applying the common electrode voltage [(Vcom)], a gate-on wire for applying [the] a gate on-voltage [Von] to the TFTs controlling the picture signals, a gate-off wire for applying the gate off-voltage [Voff], and wires for transmitting a carry-in signal or a gate-clock [signals] signal are [formed on the] extended from an edge portion

of the first substrate between the gate signal transmission film and the data signal transmission film.

APPENDIX B

The entire set of pending claims, including the "clean" version of the amended claims in this amendment, is as follows for the Examiner's convenience.

1. (Amended) A liquid crystal display, comprising:

a first substrate;

a plurality of gate lines formed on the first substrate and transmitting scanning signals;

a plurality data lines crossing over the gate lines and transmitting picture signals;

a second substrate facing the first substrate;

a liquid crystal layer formed between said first substrate and said second substrate;

a plurality of pixels demarcated by the gate lines and the data lines, the gate lines demarcating the pixels into rows, and the data lines demarcating the pixels into columns;

a black matrix defining each pixel;

a pixel electrode formed in each pixel; and

storage capacitance formed between each pixel electrode and the gate line of a previous row,

wherein an opening ratio of the pixels on a first row is different from that of the pixels on the other rows.

2. (Amended) The liquid crystal display of claim 1, wherein the opening ratio of the pixels on the first row is smaller than that of the pixels on the other rows.

3. The liquid crystal display of claim 2, wherein the difference in the opening ratio is made by differentiating an opening area of the black matrix.

4. (Amended) The liquid crystal display of claim 3, wherein the black matrix is formed on the second substrate.

8. (Amended) The liquid crystal display of claim 2, wherein the opening ratio of the pixels on the first row is 60% to 80% of that of the pixels on the other rows.

9. (Amended) A liquid crystal display, comprising:

a first substrate;

a plurality of gate lines formed on the first substrate and transmitting scanning signals;

a plurality of data lines crossing over the gate lines and transmitting picture signals;

a second substrate facing the first substrate;

a liquid crystal layer formed between said first substrate and said second substrate;

a plurality of pixels demarcated by the gate lines and the data lines, the gate lines demarcating the pixels into rows, and the data lines demarcating the pixels into columns;

a black matrix defining each pixel;

a pixel electrode formed in each pixel;

a storage capacitor line formed on said first substrate parallel to the gate line, the storage capacitor line overlapping the pixel electrodes on the first row;

first storage capacitance formed between each pixel electrode and the gate line of a previous row; and,

second storage capacitance formed between each pixel electrode on the first row and said storage capacitor line,

wherein a gate-off voltage or a common electrode voltage is applied to said storage capacitor line, and

an opening ratio of each pixel on the first row is different from that of the pixels on the other rows.

10. (Cancelled)

11. (Amended) The liquid crystal display of claim 9, wherein the opening ratio of the pixels on the first row is smaller than that of the pixels on the other rows.

12. The liquid crystal display of claim 11, wherein the difference in the opening ratio is made by differentiating an opening area of said black matrix.

13. (Amended) The liquid crystal display of claim 12, wherein said black matrix is formed on said second substrate.

14. (Amended) The liquid crystal display of claim 13, wherein an opening width of said black matrix on the first row is identical to that of said black matrix on the other rows.

15. (Amended) The liquid crystal display of claim 13, wherein an opening length of said black matrix on the first row is smaller than that of said black matrix on the other rows.

19. (Amended) The liquid crystal display of claim 11, wherein the opening ratio of the pixels on the first row is 60% to 80% of that of the pixels on the other rows.

20. The liquid crystal display of claim 9, further comprising a gate-off line formed on said first substrate to transmit a gate-off voltage.

21. The liquid crystal display of claim 20, wherein the gate-off line and said storage capacitor line are formed at the same layer as the gate line.

22. The liquid crystal display of claim 21, wherein the gate-off line and said storage capacitor line are electrically connected to each other via a connection member, and the connection member is formed at the same layer as the data line or said pixel electrode.

23. (Amended) The liquid crystal display of claim 9, further comprising:

gate signal transmission films arranged on said first substrate and provided with a gate driving integrated circuit electrically connected to the gate lines for applying gate driving signals thereto; and

data signal transmission films arranged on said first substrate and provided with a data driving integrated circuit electrically connected to the data lines for applying data driving signals thereto,

wherein a common electrode wire for applying the common electrode voltage, a gate-on wire for applying a gate on-voltage to the TFTs controlling the picture signals, a gate-off wire for

applying the gate off-voltage, and wires for transmitting a carry-in signal or a gate-clock signal are extended from an edge portion of the first substrate between the gate signal transmission film and the data signal transmission film.

24. The liquid crystal display of claim 23, the common electrode wire, the gate-on wire and the gate-off wire are formed at the same layer as the gate lines with the same material.